IS 3912 (1993): Sounding rods - Functional requirements
[WRD 1: Hydrometry]

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IS 3912 : 1993
(Reaffirmed 2004)

भारतीय मानक

गहराई नापने की छड़ें — कार्यकारी अपेक्षाएं

(पहला पुनरीक्षण)

Indian Standard

SOUNDING RODS — FUNCTIONAL REQUIREMENTS

(First Revision)

UDC 532 : 574·1

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 2

FOREWORD

This Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Fluid Flow Measurement Sectional Committee had been approved by the River Valley Division Council.

Selection of any particular method of depth measurement depends on depth of flow, velocity of current and the method of discharge observation. For example, wading rods are used when velocities are low, say, 1 m/s and depths are small and wadable, say, up to 1 m; sounding rods are used for velocities upto 2 m/s and depths say, up to 5 m and hand lines with weights are used for still greater depths and velocities.

This standard was first published in 1966. This revision has been prepared to incorporate the latest practice in the field and the use of materials like hollow steel section or aluminium pipe in the manufacture of such rods.

Indian Standard

SOUNDING RODS — FUNCTIONAL REQUIREMENTS

(First Revision)

1 SCOPE

This standard covers the functional requirements and tests for performance of sounding rods. It also covers the materials to be used for their manufacture.

2 REFERENCES

For the purpose of this standard definitions given in IS 1191 : 1971 'Glossary of terms and symbols used in connection with the measurement of liquid flow with a free surface (*first revision*)' shall apply.

3 FUNCTIONAL REQUIREMENTS

Each sounding rod shall satisfy the following requirements:

a) Its mass should be as low as possible;

b) It should be straight and have sufficient strength to withstand the force due to flowing water without significant deflection or vibration. It may be sectional to allow it to be dismantled. The sectional connection should not interfere with positioning or operation of the current metre;

c) Construction should be of corrosion resistant material;

d) It should not cause significant heading up of water due to its own obstruction;

e) The interval between graduations should permit observations to within 10 mm; graduation increaments of 0·1 m, 0·5 m and 1 m should be clearly identified. Graduations should remain visible when the rod is wet and should be wear-resistant. They should be visible from all angles;

f) It should incorporate a foot plate to prevent penetration into the bed of the channel; and

g) It should be easy to hold, specially when wet or cold.

4 TESTS

4.1 The tests given in **4.1.1** to **4.1.3** shall be carried out before the sounding rods are used in the field, on three sounding rods for every 24 of identical shape, size and dimensions.

4.1.1 The rod shall not penetrate more than 5 mm into a bed of 0·3 m depth of the same material as of the channel in which it is to be used, under a vertically applied pressure of 50 kg (in addition to its own weight).

4.1.2 When the rod is simply supported over a span equal to the length of the rod and subjected to a central concentrated load of 20 kg, the maximum deflection should not exceed 5 mm.

4.1.3 The sounding rod should have astream-lined section so as to cause minimum heading up of water which shall not exceed 2 percent of the depth of flow.

NOTE — If the limit is exceeded then other methods of depth measurement should be resorted to.

5 MATERIALS

5.1 Materials to be used for different components are given in **5.2** and **5.3**, however this does not preclude the use of alternative materials having characteristics equivalent to, or superior than, those specified. Typical details of sounding rods are given in Annex A.

5.2 Rod

The rod shall be of hollow steel section or aluminium pipe, or wood, well seasoned, straight and smooth or of bamboo, uncracked, long, straight and not green.

5.3 Base Plate

Base plate shall be manufactured out of metallic disc.

6 GRADUATIONS AND PAINTING

6.1 The rods shall be graduated in metres, decimetres and centimetres by engraving or with enamel paint or by etching and painting them with colour fast, durable black and white paint. For steel rods antirust precoat shall be given before painting the rods.

6.2 The numbers corresponding to metres and decimetres and their graduations shall be

marked conspicuously and the size of the letters shall not be less than 2·5 cm.

7 PREREQUISITES FOR SATISFACTORY PERFORMANCE

7.1 It is essential that sounding rods are marked clearly and accurately with best quality paint and they should be initially checked by an accurate steel tape. Periodical checks should be made at least twice a year and essentially after every repainting. During the process of sounding observations, it is essential that the sounding rod should be kept vertical.

ANNEX A

(*Clause* 5.1)

TYPICAL DETAILS OF SOUNDING RODS

A-1 GENERAL

Sounding rods are broadly classified into 2 groups namely, a) sounding rods for depths up to 2 and 3 m; and b) sounding rods for depths up to 6 m. Although both types of sounding rods are made of steel, aluminium and wood, longer sounding rods may also be made of bamboo for lightness in weight.

A-2 WOODEN SOUNDING RODS

A-2.1 The sounding rods shall be made of strong, completely seasoned wood, oval in shape and very smooth over its entire surfaces. It shall consist of the following parts:

a) Oval shaped wooden rod,

b) Metallic circular flange plate at the base, and

c) Connecting circular nipple.

A-2.2 Details

A-2.2.1 *Oval Shaped Wooden Rod*

The size of the oval shaped wooden rod should be about 80 mm × 20 mm, they should be 2 or 3 m long and smooth along their entire surface. It shall be graduated in metres, decimetres and centimetres with enamel paint or by etching and painting them with white and black paint. The numbers in metres and decimeters and their graduations should be marked conspicuously in red enamel paint.

A-2.2.2 *Metallic Circular Base Plate with Nipple*

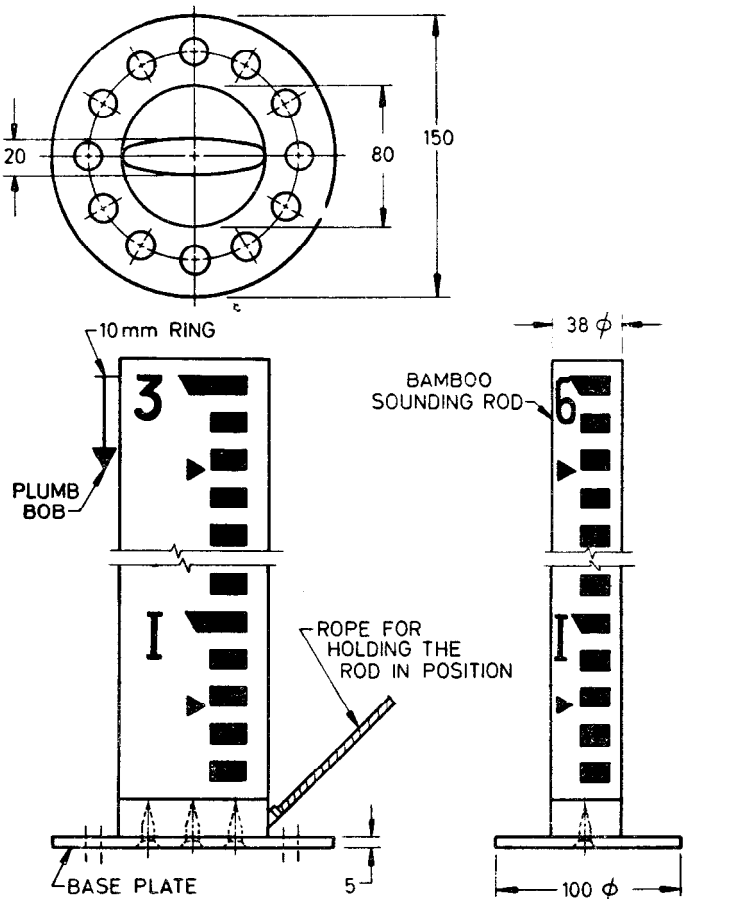
It shall consist of a metallic disc approximately 150 mm in diameter and 5 mm thick having a circular flange with an opening of about 80 mm diameter to engage a nipple of the same size. Threads should be provided in the nipple and flange and the former should be screwed securely to the latter. The entire length of the nipple should receive the circular bottom portion of the sounding rod for perfect rigidity. The flange plate may be perforated at its periphery. The bottom of the circular rod and nipple should be connected with screws. On the top of the rod, a plumb ball should be provided to ensure its verticality and a rope should be attached to the nipple to keep it reasonably vertical when the flow is rapid. Figure 1 gives the details.

A-3 BAMBOO SOUNDING RODS

A-3.1 Bamboos may also be used for sounding in depths upto 6 m. These are reasonably strong and lighter to use as compared to solid wooden rods. When bamboo is proposed to be used care should be taken to select a long, straight and strong bamboo of adequate girth, say, about 40 mm diameter. The bamboo should not be green and/or cracked. It should be correctly and clearly marked with enamel paint like the wooden oval shaped sounding rod. It should also be provided with a 100 mm diameter circular base plate with a flange to hold the bamboo rod in the same way as the oval shaped wooden rod is fixed to its base. Figure 1 gives the details.

A-4 STEEL/ALUMINIUM SOUNDING RODS

A-4.1 Steel/Aluminium pipes may be used for sounding in depths up to 4 m. These are made of steel or aluminium pipe with an outer diameter of 20 mm. These shall be graduated in metres decimetres and centimetres by engraving. The rods are made up of 1 m lengths that can be joined together by threaded joints. Base plate of steel, 100 mm in diameter and 10 mm thick is also fixed to the rod by threads. A sliding support is provided for fixing the current meter at the desired depths.



Sounding Rod for Depth up to 2 or 3 Metres

Sounding Rod for Depth up to 6 Metres

NOTE — Size of lettering not less than 2·5 cm.

All dimensions in millimetres.

FIG. 1 TYPICAL DETAILS OF SOUNDING RODS

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